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the central control unit 31 of a gateway unit 101 will perform processing shown in the flow chart of drawing 11.

[0108] That is, a central control unit 31 will read the IP address (IP address of a gateway unit 201) corresponding to the partner first-move number contained in the call setup message which received from main storage 32, if a call setup message is received (S201) (S202).

[0109] Next, a central control unit 31 sets this IP address as IP packet containing a call setup message as a destination IP address (S203), and sends out this IP packet to IP packet network IN after that (S204).

[0110] Then, when IP packet which includes that a call setup receptionist message is transmitted from a gateway unit 201 for a call setup receptionist message from waiting (S205, S206, S207) and a gateway unit 201 is received (S207;Y), a central control unit 31 is transmitting the call setup receptionist message to the line switching machine 10, and advances call setup processing (S208).

[0111] On the other hand, a central control unit 31 performs processing of S02-S09 shown in drawing 8 explained with the 1st operation form as subsequent processing, when the message of a purport which cannot transmit a call setup message to the line switching machine 20 is received from a gateway unit 201 instead of a call setup receptionist message (S209;Y) (S210).

[0112] When the gateway unit by the side of call origination transmits to the gateway unit by the side of the call in which was able to define the call setup message beforehand like the 2nd operation form explained above and this gateway unit cannot transmit a call setup message to a line switching machine, you may make it multicast a call-in propriety inquiry message.

[0113] The [3rd operation form] Next, the 3rd operation form of this invention is explained. Since the 3rd operation form has the 2nd operation form and a common feature, it mainly explains difference with the 2nd operation form. With the 3rd operation form, setup to each gateway units 101, 102, 201, and 202,203,301,302 shown in drawing 1 differs.

[0114] That is, with the 3rd operation form, the gateway unit by the side of call origination transmits a call setup message to a predetermined gateway unit like the 2nd operation form. However, the gateway unit by the side of call origination transmits a call setup message to a predetermined gateway unit, only when the success percentage of the call connection to a predetermined gateway unit has exceeded the predetermined value.

[0115] That is, the central control unit 31 of the gateway unit by the side of call origination performs processing shown in the flow chart of drawing 12, when a call setup message is received from a line switching machine.

[0116] If a call setup message is received (S301), refer to the success percentage currently held at main storage 32 for the central control unit 31 of the gateway unit by the side of call origination (S302). This success percentage shows the success percentage of the call connection at the time of transmitting a call setup message to the IP address corresponding to a partner first-move number in the time frame which went back to a certain time from this time.

[0117] For example, the gateway unit by the side of call origination is a gateway unit 101, the case where the call setup message which the gateway unit 201 received from the gateway unit 101 is able to be transmitted to the line switching machine 20 when the IP address of a gateway unit 201 is set up as an IP address corresponding to a partner first-move number is considered as "a success", the case where it cannot do is considered as "failure", and the above-mentioned success percentage is held at the main storage 32 of a gateway unit 101.

[0118] A central control unit 31 carries out the unicast of the call setup message to the gateway unit (gateway unit 202) which has an IP address corresponding to a partner first-move number, when the success percentage held at main storage 32 has exceeded the predetermined value (S303;Y) (S304). On the other hand, when success percentage has not exceeded the predetermined value, a call-in propriety inquiry message is multicast as the gateway unit group which has a multicast address corresponding to a partner first-move number (S305).

[0119] When the unicast of the call setup message is carried out, a central control unit 31 judges the success or failure of the call connection of a gateway unit 202 and the line switching machine 20 by whether the call setup receptionist message according to the call setup message was received in the predetermined time (S306).

[0120] Then, a central control unit 31 updates the value of the success percentage held at main

storage 32 according to the judgment result of success or failure (S307).

[Others] When the participation to the multicasting group for receiving a call-in propriety inquiry message or the state of secession is managed and a call-in propriety inquiry message is received from the 1st gateway about each gateway in a gateway group, you may make it IP packet network, multicast a call-in propriety inquiry message only as the gateway which has participated to the multicasting group among gateway groups by the call setup method by this invention in addition.

[0121] Moreover, you may make it a call-in propriety inquiry response message choose the 1st gateway among the gateways which transmitted the call-in propriety inquiry response message as the gateway which should transmit a call setup message for the gateway which reached the 1st gateway early most.

[0122] Moreover, when the call setup message transmitted from the 1st gateway cannot be transmitted to the 2nd line switching network, you may make it each gateway in a gateway group secede from a multicasting group.

[0123] Moreover, when it can transmit to the 2nd line switching network, you may make the call setup message transmitted from the 1st gateway each gateway unit in a gateway group participate in a multicasting group.

[0124] moreover, when a call-in propriety inquiry response message is not able to be received from the aforementioned gateway group, the 1st gateway A call setup message is transmitted to the 2nd gateway which connects the 3rd line switching network connected to the 2nd line switching network, and IP packet network. the 2nd gateway When the call setup message transmitted from the 1st gateway is received The call setup message is transmitted to the 3rd line switching network, and when a call setup message is received from the 2nd gateway, you may make it the 3rd line switching network transmit the call setup message to the 2nd line switching network.

[0125] moreover, when a call-in propriety inquiry response message is not able to be received from a gateway group, the 1st gateway A call-in propriety inquiry message is sent out towards the 2nd gateway group which connects the 3rd line switching network connected to the 2nd line switching network, and IP packet network. IP packet network When a call-in propriety inquiry message is received from the 1st gateway The call-in propriety inquiry message is multicast as the 2nd gateway group. each gateway in the 2nd gateway group When a call-in propriety inquiry message is received, when it is in the state which can be transmitted to the 3rd line switching network, a call setup message A call-in propriety inquiry response message is transmitted to the 1st gateway unit. the 1st gateway unit The gateway which should transmit a call setup message is chosen from the gateways in the 2nd gateway group which transmitted the call-in propriety inquiry response message. Transmit a call setup message to the selected gateway unit, and the selected gateway When the call setup message transmitted from the 1st gateway is received The call setup message is transmitted to the 3rd line switching network, and when a call setup message is received from the 2nd gateway, you may make it the 3rd line switching network transmit the call setup message to the 2nd line switching network.

[0126] Moreover, when the participation to the multicasting group for receiving a call-in propriety inquiry message or the state of secession is managed and a call-in propriety inquiry message is received from the 1st gateway about each gateway in the 2nd gateway group, you may make it IP packet network multicast a call-in propriety inquiry message only as the gateway which has participated to the multicasting group among the 2nd gateway groups.

[0127] Moreover, when a call setup message is transmitted to the specific gateway in a gateway group and this specific gateway cannot transmit a call setup message to the 2nd line switching network before transmitting a call-in propriety inquiry message, after receiving a call setup message from the 1st line switching network, you may make it the 1st gateway transmit a call-in propriety inquiry message to a gateway group.

[0128] Moreover, when the data about transfer of the call setup message from the specific gateway in a gateway group to the 2nd line switching network are held and a call setup message is received from the 1st line switching network, you may make it the 1st gateway choose whether a call setup message is transmitted to the specific gateway, or a call-in propriety inquiry message is transmitted towards a gateway group based on the held data.

[0129] Moreover, this invention can also be constituted as the gateway which connects a line

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switching network and IP packet network. The table which holds the multicast address corresponding to the destination of the call setup message transmitted from a line switching network when the call to which the gateway unit by this invention led IP packet network between a line switching network and other line switching networks is set up, The read-out section which reads the multicast address corresponding to the destination of this call setup message from a table when a call setup message is received from a line switching network, The read multicast address is equipped with the editorial department which edits the packet set up as the destination, and the transmitting section which sends out the edited packet to IP packet network, including a call-in propriety inquiry message. A multicast address is each address of two or more of other gateways which connect other line switching networks and IP packet networks, and when a call-in propriety inquiry message receives a call setup message to each of other gateways, it is a message for asking whether the call setup message can be transmitted to other line switching networks.

[0130] Moreover, after edited IP packet is sent out on IP packet network, you may make it the gateway by this invention transmit a call setup message to other gateway units to which were further equipped with the receive section which receives the call-in propriety inquiry response message corresponding to a call-in propriety inquiry message, and the transmitting section transmitted this call-in propriety inquiry response message when a call-in propriety inquiry response message was received by the receive section.

[0131]

[Effect of the Invention] According to the call setup method of the network system by this invention, retransmitting a message to the call setup message from the line switching network by the side of call origination repeatedly is prevented. For this reason, the load up of IP packet network by the repeat of retransmission of message is prevented.

[Translation done.]

* NOTICES *

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1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

CLAIMS

[Claim(s)]

[Claim 1] The 1st gateway which connects the 1st line switching network, IP packet network, and the 1st line switching network and IP packet network, It is the call setup method of the network system equipped with the gateway group which connects the 2nd line switching network, and the 2nd line switching network and IP packet network, respectively. When the call which led IP packet network between the 1st line switching network and the 2nd line switching network by the 1st line switching network's becoming a call origination side, and the 2nd line switching network becoming a call-in side is set up, the 1st gateway When a call setup message is received from the 1st line switching network, since the gateway which can be transmitted to the 2nd line switching network is specified, this call setup message A call-in propriety inquiry message is transmitted to IP packet network. IP packet network The call-in propriety inquiry message which received from the 1st gateway unit is multicasted as a gateway group. each gateway in a gateway group When a call-in propriety inquiry message is received, when it is in the state which can be transmitted to the 2nd line switching network, a call setup message A call-in propriety inquiry response message is transmitted to the 1st gateway unit. the 1st gateway unit The call setup method of a network system of choosing the gateway which should transmit a call setup message out of the gateway which transmitted the call-in propriety inquiry response message, and transmitting a call setup message to the selected gateway unit.

[Claim 2] The aforementioned IP packet network is the call setup method of the network system according to claim 1 which multicasts a call-in propriety inquiry message only as the gateway which has participated to the multicasting group among the aforementioned gateway groups when the participation to the multicasting group for receiving a call-in propriety inquiry message or the state of secession is managed and a call-in propriety inquiry message is received from the 1st gateway of the above about each gateway in the aforementioned gateway group.

[Claim 3] The 1st gateway of the above is the call setup method of the network system according to claim 1 or 2 which chooses the gateway to which the call-in propriety inquiry response message reached the 1st gateway early most among the gateways which transmitted the call-in propriety inquiry response message as the gateway which should transmit a call setup message.

[Claim 4] Each gateway in the aforementioned gateway group is the call setup method of a network system according to claim 2 of seceding from the aforementioned multicasting group when the call setup message transmitted from the 1st gateway cannot be transmitted to the 2nd line switching network.

[Claim 5] Each gateway unit in the aforementioned gateway group is the call setup method of the network system according to claim 2 which participates the call setup message transmitted from the 1st gateway in the aforementioned multicasting group when it can transmit to the 2nd line switching network.

[Claim 6] When a call-in propriety inquiry response message is not able to be received from the aforementioned gateway group, the 1st gateway of the above A call setup message is transmitted to the 2nd gateway which connects the 3rd line switching network connected to the 2nd line switching network, and IP packet network. the 2nd gateway When the call setup message transmitted from the 1st gateway is received It is the call setup method of a network system according to claim 1 of transmitting the call setup message to the 2nd line switching network by transmitting the call setup

message to the 3rd line switching network when the 3rd line switching network receives a call setup message from the 2nd gateway.

[Claim 7] When a call-in propriety inquiry response message is not able to be received from the aforementioned gateway group, the 1st gateway of the above A call-in propriety inquiry message is sent out towards the 2nd gateway group which connects the 3rd line switching network connected to the 2nd line switching network, and IP packet network. IP packet network When a call-in propriety inquiry message is received from the 1st gateway The call-in propriety inquiry message is multicasted as the 2nd gateway group. each gateway in the 2nd gateway group When a call-in propriety inquiry message is received, when it is in the state which can be transmitted to the 3rd line switching network, a call setup message A call-in propriety inquiry response message is transmitted to the 1st gateway unit. the 1st gateway unit The gateway which should transmit a call setup message is chosen from the gateways in the 2nd gateway group which transmitted the call-in propriety inquiry response message. Transmit a call setup message to the selected gateway unit, and the selected gateway When the call setup message transmitted from the 1st gateway is received It is the call setup method of a network system according to claim 1 of transmitting the call setup message to the 2nd line switching network by transmitting the call setup message to the 3rd line switching network when the 3rd line switching network receives a call setup message from the 2nd gateway.

[Claim 8] The aforementioned IP packet network is the call setup method of the network system according to claim 7 which multicasts a call-in propriety inquiry message only as the gateway which has participated to the multicasting group among the aforementioned 2nd gateway groups when the participation to the multicasting group for receiving a call-in propriety inquiry message or the state of secession is managed and a call-in propriety inquiry message is received from the 1st gateway of the above about each gateway in the aforementioned 2nd gateway group.

[Claim 9] The 1st gateway of the above is the call setup method of a network system according to claim 1 of transmitting a call-in propriety inquiry message to the aforementioned gateway group when a call setup message is transmitted to the specific gateway in the aforementioned gateway group and this specific gateway cannot transmit a call setup message to the 2nd line switching network before transmitting a call-in propriety inquiry message, after receiving a call setup message from the 1st line switching network.

[Claim 10] The 1st gateway of the above is the call setup method of the network system according to claim 1 which chooses whether a call setup message is transmitted to the aforementioned specific gateway, or a call-in propriety inquiry message is transmitted towards the aforementioned gateway group based on the aforementioned data when the data about transfer of the call setup message from the specific gateway in the aforementioned gateway group to the 2nd line switching network are held and a call setup message is received from the 1st line switching network of the above.

[Claim 11] It is the gateway which connects a line switching network and IP packet network. The table which holds the multicast address corresponding to the destination of the call setup message transmitted from the aforementioned line switching network when the call which led IP packet network between the aforementioned line switching network and other line switching networks is set up, The read-out section which reads the multicast address corresponding to the destination of this call setup message from the aforementioned table when a call setup message is received from the aforementioned line switching network, With the editorial department where the read multicast address edits the packet set up as the destination, including a call-in propriety inquiry message It has the transmitting section which sends out the edited packet to IP packet network. the aforementioned multicast address It is each address of two or more of other gateways which connect other line switching networks and IP packet networks. the aforementioned call-in propriety inquiry message The gateway which is a message for asking each of the gateway besides the above whether the call setup message can be transmitted to other line switching networks when a call setup message is received.

[Claim 12] It is the gateway according to claim 11 by which it has further the receive section which receives the call-in propriety inquiry response message corresponding to the aforementioned call-in propriety inquiry message after IP packet by which edit was carried out [aforementioned] is sent out on IP packet network, and the aforementioned transmitting section transmits a call setup message to other gateway units which transmitted this call-in propriety inquiry response message when a call-in propriety inquiry response message is received by the aforementioned receive section.

[Translation done.]